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Process for making inorganic oxide gels in fluorocarbon solvents

Description of Technology: This invention relates to a process for the preparation of an inorganic oxide gel comprising contacting at least one fluorinated inorganic oxide precursor with a fluorinated gelling agent in the presence of at least one fluorinated solvent to form a solution; allowing sufficient time for gelation to occur; and isolating the inorganic oxide gel. Gels made by this process are useful as coatings and as components in inorganic/organic hybrid materials.

Patent Listing:

1. **US Patent No.** 5,876,686, March 2, 1999, "Process for making inorganic oxide gels in fluorocarbon solvents."
http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=5,876,686.PN.&OS=PN/5,876,686&RS=PN/5,876,686

Market Potential: The process of the present invention concerns hydrolysis and condensation of inorganic oxide precursors in a fluorinated solvent. Fluorinated solvents have not previously been used for such processes due to their incompatability with water, catalysts and inorganic oxide precursors.

It is desirable to generate hybrid inorganic and fluoropolymer materials with very small inorganic domains (<75 nm) so as to improve the durability of the fluoropolymer. It is well known that small inorganic particles can be generated via sol-gel chemistry. However, such chemistry is not practiced in perfluorinated solvent systems which are essential for dissolving said fluoropolymers.

Benefits:

- Improved durability of fluorpolymer.

Applications:

- Coatings.
- Components in inorganic/organic hybrid materials.

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